

Substance Use Prevention Among At-Risk Rural Youth: Piloting the Social Ecological One Life Program

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Abstract: Substance use among youth is a significant health concern in the rural United States, particularly among at-risk students. While evidence-based programs are available, literature suggests that an underdeveloped rural health prevention workforce often limits the adoption of such programs. Additionally, population-size restrictions of national mentoring programs can hinder their adoption in rural areas. This study sought to determine the effectiveness of a school-based group-matched mentoring program on at-risk students in two rural Missouri school districts using an intervention-control group design. At-risk students ($n = 65$) identified by school officials participated in a school-based mentoring program (*One Life*) designed to reduce substance use and impact social ecological risk factors. Compared to controls ($n = 29$), participants indicated reductions in 30-day use of tobacco ($p = .037$), alcohol ($p = .001$), and inhalants ($p < .001$). Additional benefits included increased interest in higher education and improved skills in peer development ($p < .05$). Social ecological mentoring can be a viable option for school-based drug prevention programs targeting at-risk rural youth.

The use of licit and illicit drugs among youth is a significant health concern for rural health educators. Multiple studies have indicated the risk for use and abuse of alcohol and other drugs is higher in rural areas across the U.S. when compared to nonrural or urban areas (Dunn et al., 2008; Eberhardt, Ingram, & Makuc, 2001; Van Gundy, 2006; Williams, Barnes, & Leoni, 2011; Wright & Sathe, 2005). In an effort to improve public health research and knowledge on this issue, the National Rural Health Research Center identified substance abuse as priority health issue in 2001. Moreover, substance abuse was ranked in the top 10 of rural health priorities in the Rural Healthy People 2010 Project (Gamm, Hutchison, Bellamy, & Dabney, 2002). Because substance use is correlated to multiple risky behaviors throughout the lifespan (Spooner, 1995; Timmermans, Van Lier, & Koot, 2007; Tolou-Shams, Brown, Gordon, & Fernandez, 2007), there is a tremendous need for drug prevention and early intervention programs in rural areas.

While dozens of evidence-based drug prevention and intervention programs are available, there are consistent and widely acknowledged implementation barriers that may limit program effectiveness or preclude program implementation (Amodeo, et al., 2011; Cawood, 2010; Forman, Olin, Hoagwood, Crowe, & Saka, 2009; Gottfredson & Gottfredson, 2002; Hallfors & Godette, 2002; Skager, 2007). One such programmatic strategy that has gained favor over the last decade is mentoring (Bellamy, Springer, Sale, & Espiritu, 2004; Kolar & McBride,

2011; Rhodes & Dubois, 2008; Vannest et al., 2008); yet, initiating and implementing nationally recognized mentoring programs in rural areas is difficult due to the population-size restrictions for new program sites (Williams et al., 2010). Despite the challenge of adopting mentoring programs in rural areas, health educators continue to seek such programs because potential benefits include improved academic retention, enhanced mental and physical health, and reductions in risky behaviors (Beier, Rosenfeld, Spitalny, Zansky, & Bontempo, 2000; DuBois, Holloway, Valentine, & Cooper, 2002; DuBois & Silverthorn, 2005; Eby, Allen, Evans, Ng, & DuBois, 2008; Rhodes, Reddy, & Grossman, 2005).

Though evidence exists of the positive impact of mentoring programs, there is much inconsistency in program outcomes (Bellamy et al., 2004; DuBois et al., 2002). Bellamy and colleagues (2004) reported that the Center for Substance Abuse Prevention's evaluation of the 15-site mentoring initiative Project Youth Connect showed no significant differences in drug use and other drug-related factors among mentored youth and nonmentored youth. Inconsistent evaluative outcomes for mentoring programs are often related to the lack of fidelity in program implementation (Bellamy et al., 2004). Identified implementation barriers for mentoring programs include insufficient intensity, disorganized program structure, and mentor retention (Bellamy et al., 2004; DuBois et al., 2002; National Center for Mental Health Promotion and Youth Violence Prevention, n.d.).

Social Ecology in Mentoring Programs

Despite the barriers and lack of consistent results, mentoring programs continue to be funded and adopted, and now serve three million youth across the United States (DuBois, Portillo, Rhodes, Silverthorn, & Valentine, 2011). Literature review suggests that the social ecology model has been used extensively to explore influences on risky behaviors among youth (Ennett et al., 2008; Kumpfer & Turner, 1991; Mason et al., 2010; Riner & Saywell, 2002; Stephens, 2001; Williams, 2012; Williams et al., 2006; Williams et al., 2008); yet, it has not been used as a program design framework for mentoring programs. Social ecology of health suggests that behavior is influenced by the interaction of personal, social, and environmental factors including intrapersonal factors, interpersonal factors, institutional or organizational factors, community factors, and public policy (McLeroy, Bibeau, Steckler, & Glanz, 1988). Social ecology has also been used to guide needs assessments related to drug use among rural youth (Williams et al., 2011); therefore, the utility of this behavioral model in program design should be examined. The purpose of this study was to pilot test the impact of a school-based, social ecological group mentoring program on at-risk students in two rural Missouri school districts using a pre-post intervention-comparison group design. Of specific interest was the One Life program's impact on drug consumption and intrapersonal social ecological influences of drug use as identified by Williams et al. (2011).

Methods

Participants

This study used a pre-post intervention-comparison group design to implement a social ecological mentoring program in two rural, southeastern Missouri communities for one academic year. The program was implemented in two school districts, while data were collected from a comparison group in a third district for a total sample of $n = 94$. The intervention group ($n = 65$) consisted of rural youth in grades 8 - 10 with a mean age of 14.7 years, while the control group ($n = 29$) consisted of rural youth in grades 8 - 10 with a mean age of 15.6 years. Table 1 indicates demographic breakdown of all participants. Youth in the intervention group were identified by school officials to be considered at-risk due to past discipline problems, poor academic performance, and/or unstable home life.

Table 1

Demographics of Youth Participants in the One Life Pilot Program

	Intervention n (%)	Control n (%)
Sex		
Female	35 (53.8)	15 (51.7)
Male	30 (46.2)	14 (48.3)
Race		
African American	42 (64.6)	17 (58.6)
Caucasian	23 (35.4)	12 (41.4)
Grade		
8	18 (27.7)	6 (20.7)
9	30 (46.1)	10 (34.5)
10	17 (26.2)	13 (44.8)

Program Development

While many mentoring and substance abuse prevention programs exist, the standard of practice is to implement targeted evidence-based strategies to improve the potential for positive behavioral impact. An advanced search of the U.S. Substance Abuse and Mental Health Services Administration's (U.S. SAMHSA) National Registry of Evidence-based Prevention Programs and Practices yielded only one existing rural, school-based substance abuse prevention program targeting adolescents aged 13 - 17 which includes a mentoring component (U.S. SAMHSA, 2013). This program, titled Protecting You/Protecting Me, focuses on alcohol prevention and vehicle safety using high school students as educators for an elementary school population (Bell, Kelley-Baker, Rider, & Ringwalt, 2005; Bohman et al., 2004; Padgett, Bell, Shamblen, & Ringwalt, 2005). While Protecting You/Protecting Me has shown a positive impact on youth, the program did not meet the comprehensive substance use prevention needs for the population included in this study (Leoni, Williams, Barnes, 2008; Williams et al., 2011); therefore, a social ecological program was developed based on the recommendations of Williams et al. (2011).

Assessments of Missouri youth have indicated high rates of drug use particularly among youth in the Southeastern region of the state (Evans, Sale, Breejen, & Dupue, 2010; Evans et al., 2006; Williams et al., 2011). A comprehensive social and epidemiological assessment of drug use among rural Missouri youth in the targeted area previously identified both macro- and micro-level influences on substance use which included perceived lack of value in education, myopic life views, lack of positive adult role models, and community acceptance of risky behaviors (Leoni et al., 2008; Williams et al., 2011). The mentoring program tested in this study was designed using the proposed model of social ecological influences on rural youth drug use focusing specifically on intrapersonal influences (Leoni et al., 2008; Williams et al., 2011). To create and implement the program, researchers collaborated with regional institutions including the youth judiciary system, two local school districts, and a regional support center, which routinely provides technical assistance for substance abuse prevention.

The program consisted of three interrelated components designed to engage students in both the school and community, while providing mentorship through a trained cadre of local university students. The components included a lighted schoolhouse, life-coaching, and career planning. These strategies were implemented over a four-month period during the academic school year.

Lighted schoolhouse. In an effort to reduce risk factors for at-risk youth, the lighted schoolhouse model has been successfully implemented in U.S. schools in the past (Hexter, Kaufman, Chandler, Sikes-Gilbert, & Aleman, n.d.; Stephens, Tullis, Sanchez, & Gonzalez, 1991). Lighted schoolhouse programs aim to provide a healthy, positive environment for youth by hosting various events on the school campus during after-school hours. Each of the two school districts participating in this pilot program assigned a faculty or staff member to assist in lighted schoolhouse events, which took place biweekly alternating between each school district. Events included recreation, leisure, and physical activity.

Life-coaching. At-risk youth were matched with trained mentors who met with program participants biweekly during school hours

in the fall and spring semesters. Group mentoring sessions lasted 45-60 minutes each and consisted of lifestyle enhancement coaching through a developmental assets curriculum, as well as tutoring for participant's academic work. All mentors ($n = 12$) were trained through official college-credit coursework at a local university in the principles and practices of mentorship and completed a school-district background check prior to approval for acceptance in this program. Mentors were assigned one group of at-risk youth per school with each mentoring group consisting of four to six participants.

My Future career planning. Prior studies have suggested that at-risk rural youth in Missouri do not view college as a viable option for career development (Leoni et al., 2008; Williams et al., 2011). Among the reasons for this lack of interest in higher education are unwillingness to leave the area, perceived lack of professional jobs in the region, and failure to value a college education (Williams et al., 2011). This program component consisted of career mentoring through the exploration in higher education, vocational training, and technical trades available through a regional university and vocational school. Researchers collaborated with a team of local professionals who agreed to deliver presentations to program participants on the benefits of educational training and the career opportunities in their specific fields. Professionals were from fields requiring college degrees such as education, nursing, and agriculture, as well as vocational training such as welding, appliance repair, and paramedics.

Data Collection

Baseline and posttest surveys were administered to all participants. The drug abstinence domain of the U.S. Substance Abuse and Mental Health Services Administration's National Outcome Measures (MO Department of Mental Health, n.d.) was used to measure age-at-first use and 30-day use for tobacco, alcohol, inhalants, marijuana, and other illegal drugs. Age-at-first use was measured only at baseline as this variable could not be impacted at posttest. Thirty-day use was dichotomized into use and no use. Other survey items were added to measure intrapersonal social ecological influences on rural drug use as identified by Williams and colleagues (2011). Intrapersonal measures included scales in higher education interest (3 items; alpha reliability = 0.71), favorable attitudes toward use (5; 0.78), and social skills (5; 0.63).

Results

At baseline, age-at-first use was measured for tobacco (mean = 10.7 years), alcohol (9.9), inhalants (12.4), marijuana (11.0), and other illegal drugs (no reported use among participants), with no significant differences between intervention and control groups for any substance. Additionally, there were no significant differences when examined by sex, race, or grade; however, males were slightly more likely to indicate earlier onset of use for all four substance categories.

Thirty-Day Use

At baseline, intervention and control group chi-square analyses indicated no statistically significant differences in 30-day use for any of the four substances. Posttests revealed significant ($p < .05$)

reductions in 30-day use of tobacco, alcohol, and inhalant use among the intervention group, but no significant change in marijuana use. Among the control group, a significant increase in 30-day alcohol was observed at posttest ($p = .001$), but no differences were reported for tobacco, inhalant, and marijuana. Comparisons of posttest 30-day use revealed a significant difference between intervention and control groups for tobacco, alcohol, and inhalant use (Table 2).

Intrapersonal Measures

Participants were asked about their intentions to pursue higher education after graduating high school. Specific questions asked about intentions to pursue a two-year/associate's degree, four-year/bachelor's degree, or technical/vocational training. Participants in the intervention group reported statistically significant increases in two-year and four-year degrees ($p < .05$), while no significant difference was seen for interest in vocational training. Controls showed no significant improvement in interest in any of the three higher education levels, with interest in vocational training significantly decreasing from baseline to posttest ($p = .010$). Posttest comparisons between intervention and control groups indicate that participation in the One Life program has a significant impact on participants' interest in all levels of higher education (Table 3).

The Center for Substance Abuse Prevention's Favorable Attitudes Towards Use Scale (Currie & Perry, 2003) was also used to examine intrapersonal influences among the participants. The four-item scale contained questions about how wrong the participants thought it was for someone their own age to consume alcohol, tobacco, marijuana, or illegal drugs. One additional item was added to collect attitudinal data on inhalant use. Within the intervention group, a significant difference was seen regarding alcohol attitudes at posttest. Participants were more likely to report a belief that using alcohol was "wrong" or "very wrong" after completing the One Life program. No posttest differences were observed for attitudes towards tobacco, inhalants, marijuana, or other illegal drugs. Additionally, posttest comparisons of intervention and control groups revealed significant differences in alcohol attitudes, but no other substance (Table 4).

Five measures of social skills were assessed at baseline and posttest. Social skill subscales included decisional impact (one item), friendship development (two items), and family communication (two items). Statistically significant changes were observed only in the area of friendship development as intervention participants were significantly more likely to find it easier to make friends ($p = .047$) and knew how to make friends of the opposite sex ($p = .000$) at posttest. Additionally, intervention participants indicated increased skills in friendship development compared to the comparison group ($p < .05$) at posttest. Of particular note is the improvement in friendship development with the opposite sex. Intervention participants improved significantly from baseline to posttest (69.2% - 86.2% reporting comfort with making friend of the opposite sex), while comparison group participants indicated a statistically significant decrease (65.5% - 55.2%). While not significant, intervention participants did report improvements or no change in the other sub-scales of decisional impact and family communication (Table 5).

Table 2

Comparison of 30-Day Consumption Rates Between Intervention and Control Groups (n; % Reporting Use)

	Intervention (n = 65)		Control (n = 29)		Posttest Comparisons of Intervention & Control Groups (p)
	Baseline	Posttest	Baseline	Posttest	
30-Day Alcohol	24; 36.9	*19; 29.2	11; 37.9	*13; 44.8	.001
30-Day Tobacco	20; 30.8	*13; 20.0	9; 31.0	8; 27.6	.037
30-Day Inhalants	17; 26.2	*6; 9.2	8; 27.6	8; 27.6	.000
30-Day Marijuana	18; 27.7	17; 26.2	8; 27.6	7; 24.1	.174

*p < .05 from baseline to posttest.

Table 3

Comparison of Higher Education Interest Between Intervention and Control Groups (n; % Reporting Intention to Pursue Higher Education)

	Intervention (n = 65)		Control (n = 29)		Posttest Comparisons of Intervention & Control Groups (p)
	Baseline	Posttest	Baseline	Posttest	
2-Yr/Associate's	39; 60.0	*59; 90.8	16; 55.2	17; 58.6	.000
4-Yr/Bachelor's	64; 83.1	*59; 90.8	24; 82.8	24; 82.8	.009
Technical/Vocational	40; 61.5	42; 64.6	15; 51.7	*12; 41.4	.000

*p < .05 from baseline to posttest.

Table 4

Comparison of Attitudes Towards Drug Use Between Intervention and Control Groups (n; % Reporting Use of Substance Was Wrong/Very Wrong)

	Intervention (n = 65)		Control (n = 29)		Posttest Comparisons of Intervention & Control Groups (p)
	Baseline	Posttest	Baseline	Posttest	
Alcohol	22; 33.8	*25; 38.5	9; 31.0	7; 24.1	.031
Tobacco	18; 27.7	18; 27.7	8; 27.6	10; 34.5	.087
Inhalants	19; 29.2	21; 32.3	12; 41.4	10; 34.5	.214
Marijuana	40; 61.5	43; 66.1	17; 58.6	18; 62.1	.099
Other Illegal Drugs	58; 89.2	57; 87.7	27; 93.1	26; 89.7	.356

*p < .05 from baseline to posttest.

Table 5

Comparison of Social Skills Between Intervention and Control Groups (n; %)

	Intervention (n = 65)		Control (n = 29)		Posttest Comparisons of Intervention & Control Groups (p)
	Baseline	Posttest	Baseline	Posttest	
Think about impact of my decisions	36; 55.4	38; 58.5	16; 55.2	16; 55.2	.178
Know how to make friends with opposite sex	45; 69.2	*56; 86.2	19; 65.5	*16; 55.2	.000
Find it easy to make new friends	48; 73.8	*53; 81.5	21; 72.4	22; 75.8	.047
Listen to family members	36; 55.4	36; 55.4	18; 62.1	17; 58.6	.294
Frequently talk to adult about actions/thoughts	43; 66.2	45; 69.2	20; 69.0	19; 65.5	.401

*p < .05 from baseline to posttest.

Discussion

Rural youth have significant substance abuse problems that need to be addressed by both members of the scientific community and practitioners. Results of the One Life program indicate that a short-term, group-matched mentoring program can have a significant impact on substance use rates of at-risk rural youth. Although some of the changes seen as a result of the One Life program may seem modest, their significance is much larger if viewed from a broader public health perspective. From a practical standpoint these changes may be regarded as the beginning of a change in social norms, which may affect gradual change in a community. Each member of a relatively small and close-knit rural community not involved in substance abuse has the potential to influence many others. Social norms do not change overnight but take many years to change and every individual who understands the consequences of their actions and has been exposed to programs such as One Life is better protected from substance abuse and other risky behaviors. In addition, substance abuse is correlated with poor academic performance and numerous other social problems so successful prevention efforts have far-reaching impact. The components of the One Life Program could potentially be used for longer periods of time and demonstrate more significant impact.

A huge advantage of a program such as One Life is that it was implemented in a “real world” practical setting using relatively modest resources that many communities could leverage. Small rural communities are often the areas with the fewest resources for substance abuse treatment so prevention is of critical importance (No Place to Hide, 2000). Early intervention efforts may help alleviate demand on many other scarce rural resources such as law enforcement and social services.

Finding mentors was not a problem in this study. Many of the mentors were from small rural communities and their personal experiences growing up in such areas gave them unique insights into the challenges facing this rural youth population and may have contributed to the success of the One Life program. Mentoring is a skill that many young professionals can use in their careers particularly if they are entering fields such as social work, recreation, counseling, or substance abuse prevention. Universities and other educational settings may be willing to partner with outside groups to both train mentors and give those mentors experiential activities related to their field of study.

The utility of the social ecological framework aided in the development and implementation of the One Life program. The holistic concept of social ecology indicates that behavioral influences are multifaceted and successful change requires intervention at multiple levels (Atzaba-Poria, Pike, & Deater-Deckard, 2004; Evans, Williams, & Perko, 2008; McLeroy, Bibeau, Steckler, & Glanz, 1988). This program focused on the two intrapersonal-level constructs—myopic view of life and limited value in education—as identified by Williams et al. (2011). While this program targeted these two intrapersonal constructs, the implementation strategies also impacted interpersonal influences through life-coaching which gave at-risk youth the opportunity to interact with trained mentors in a positive, social environment confirming previous research findings (DuBois & Silverthorn, 2005; Eby et al., 2008; Rhodes, Reddy, & Grossman, 2005).

Additionally, the school-community collaboration and utilization of the lighted schoolhouse model provided a level of positive institutional influence, as well as a recognizable facility within the community. The lighted schoolhouse model is based on the notion that developing school-community partnerships and allowing use of

the school facility beyond normal school hours can help to improve home-school relations thereby impacting education of youth (Graue & Sherfinski, 2011). Because the One Life program offered fun and healthy recreational activities through the lighted schoolhouse environment, it provided an opportunity for the at-risk youth participants to improve school bonding which has been shown to be an essential component in youth prevention (Maddox & Prinz, 2003).

A limitation of this study was the self-selection of subjects and the fact that it was a relatively homogenous population. Interventions similar to the ones described in this study should be planned, implemented, and evaluated in other communities including different age groups, socioeconomic groups, and in different settings such as urban and suburban. Youth in all communities are subjected to a wide range of influences and each community has its own set of circumstances. This being the case, it is imperative that a sound assessment be conducted prior to program planning. Finally, the importance of environmental protection strategies cannot be overstated. These strategies need to be tailored to the unique cultural situations found in rural communities and many factors may need to be addressed. Successful strategies will be more likely if supported by all segments of the community including interests such as the business community, health care, law enforcement, education, civic groups, faith-based organizations, and local politicians.

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